DevOps & MLOps

Activity 1

Create an ML model for the diabetes data and deploy using Docker.

Prerequisites:
VS Code
VS Code Extension – Python
Docker
Docker Hub

Step 1 (model.py)

Creation of ML Model and Pickle(.pkl) file

Note: After the successful completion, model.pkl will be generated.

```
import pickle

from  sklearn import  datasets

iris=datasets.load_iris()

x=iris.data

y=iris.target

#labels for iris dataset

labels ={

  0: "setosa",

  1: "versicolor",

  2: "virginica"

}

#split the data set

from sklearn.model_selection import train_test_split

x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=.60)


#Using decision tree algorithm

from sklearn import tree

classifier=tree.DecisionTreeClassifier()

classifier.fit(x_train,y_train)

predictions=classifier.predict(x_test)
```

```
#export the model
pickle.dump(classifier, open('model.pkl','wb'))

#load the model and test with a custom input
model = pickle.load( open('model.pkl','rb'))
x = [[6.7, 3.3, 5.7, 2.1]]
predict = model.predict(x)
print(predict)
print("Hello Worlds")
print(labels[predict[0]])
```

Step 2 (server.py)

Creation of UI and Web Framework using Streamlit

```
import streamlit as st
import pickle
model = pickle.load(open('model.pkl', 'rb'))

def predict(sl,sw,pl,pw):
    prediction=model.predict([[sl,sw,pl,pw]])
    return prediction

def main():
    st.title("IRIS Prediction")
    html_temp = """
    <div style="background-color:tomato;padding:10px">
    <h2 style="color:white;text-align:center;">Streamlit IRIS Predictor </h2>

    </div>
    """
    st.markdown(html_temp,unsafe_allow_html=True)
```

```
    sl = st.text_input("Sepal Length","Type Here")
    sw = st.text_input("Sepal Width","Type Here")
    pl = st.text_input("Petal Length","Type Here")
    pw = st.text_input("Petal Width","Type Here")
    result=""
    if st.button("Predict"):
        result=predict(sl,sw,pl,pw)
    st.success('The output is {}'.format(result))

    if st.button("About"):
        st.text("Lets LEarn")
        st.text("Built with Streamlit")
main()
```

(to run this server.py use -> streamlit run server.py (or) python –m streamlit server.py)

Step 3

Generate requirement file

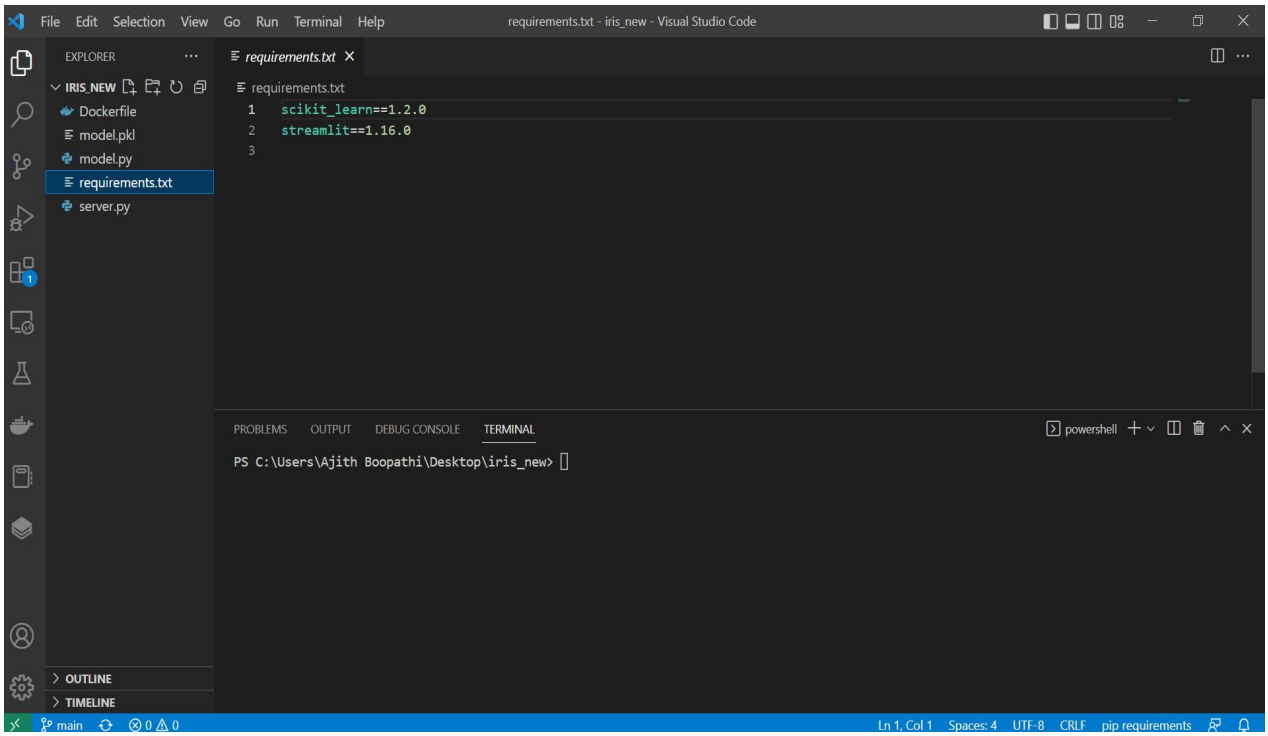
Note

a. Run the below script in VS Code terminal window of your project directory.

b. After the successful completion, it generates a requirements.txt file.

i.pip install pipreqs (or) python –m pip install streamlit

ii. pipreqs . (or) python –m pipreqs.pipreqs



Step 4

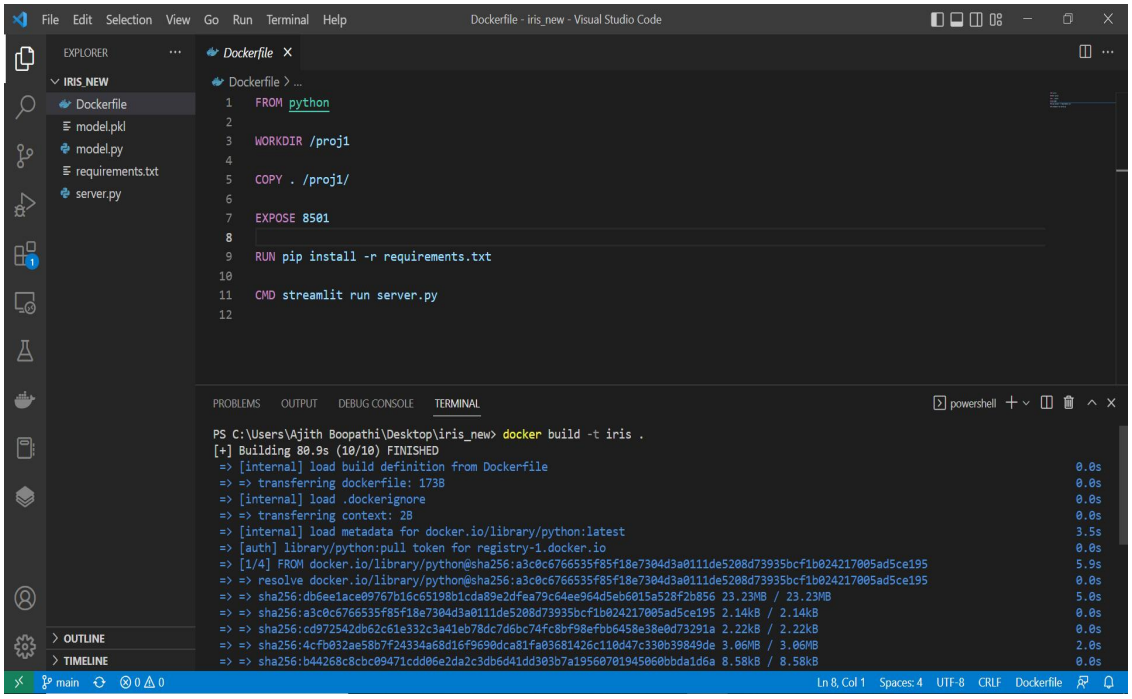
Creation of Docker file.

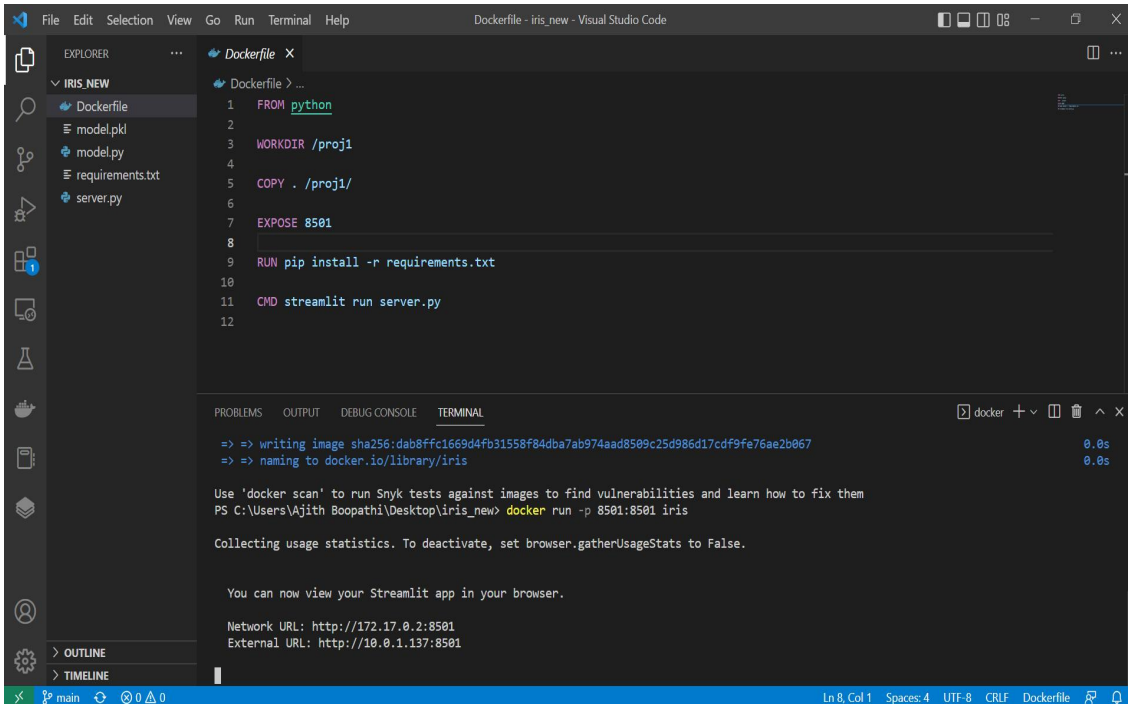
```
FROM python
WORKDIR /pythondir
COPY . /pythondir
EXPOSE 8501
RUN pip install -r requirements.txt
CMD streamlit run app.py
```

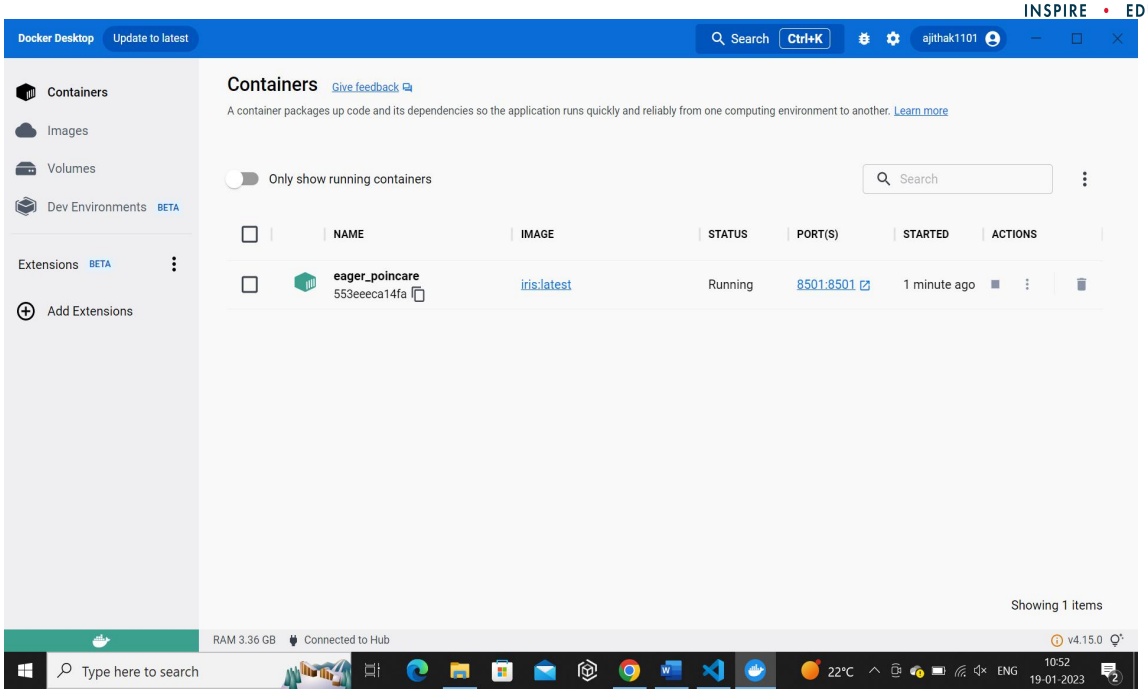
Step 5

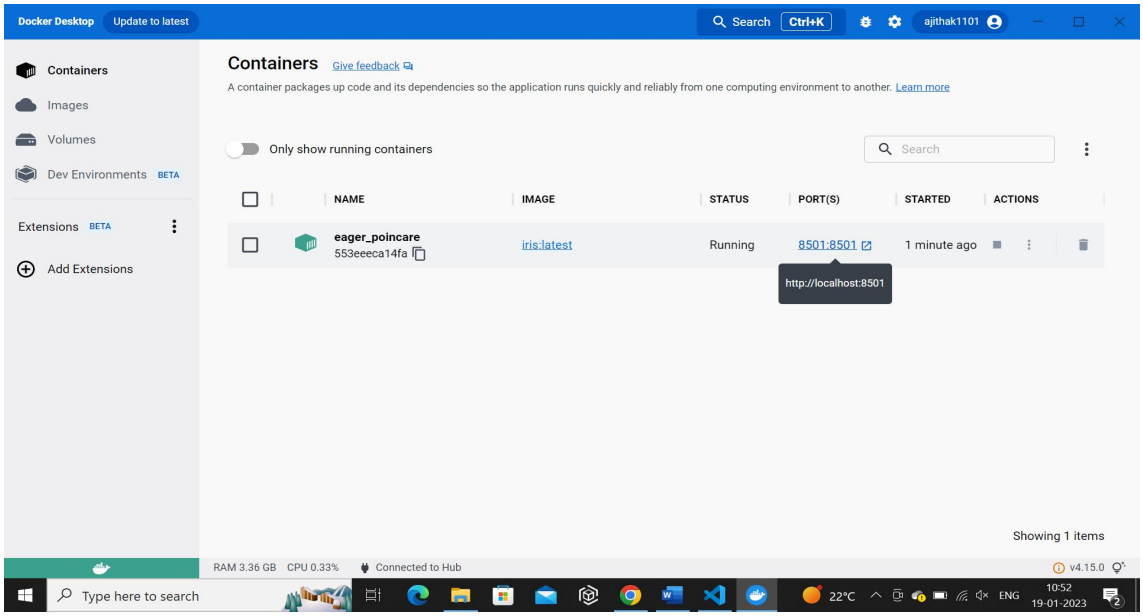
Run the following script in VS Code terminal

docker build –t iris .
docker run -p 8501:8501 iris






Docker Desktop
Update to latest
Search Ctrl+K
ajithak1101
Containers
Images
Volumes
Dev Environments BETA
Extensions BETA
Add Extensions
Containers
Give feedback
A container packages up code and its dependencies so the application runs quickly and reliably from one computing environment to another. Learn more
Only show running containers
Search
NAME
IMAGE
STATUS
PORT(S)
STARTED
ACTIONS
eager_poincare
553eeeca14fa
iris:latest
Running
8501:8501
1 minute ago
Showing 1 items
RAM 3.36 GB
Connected to Hub
v4.15.0
Type here to search
22°C
ENG
10:52
19-01-2023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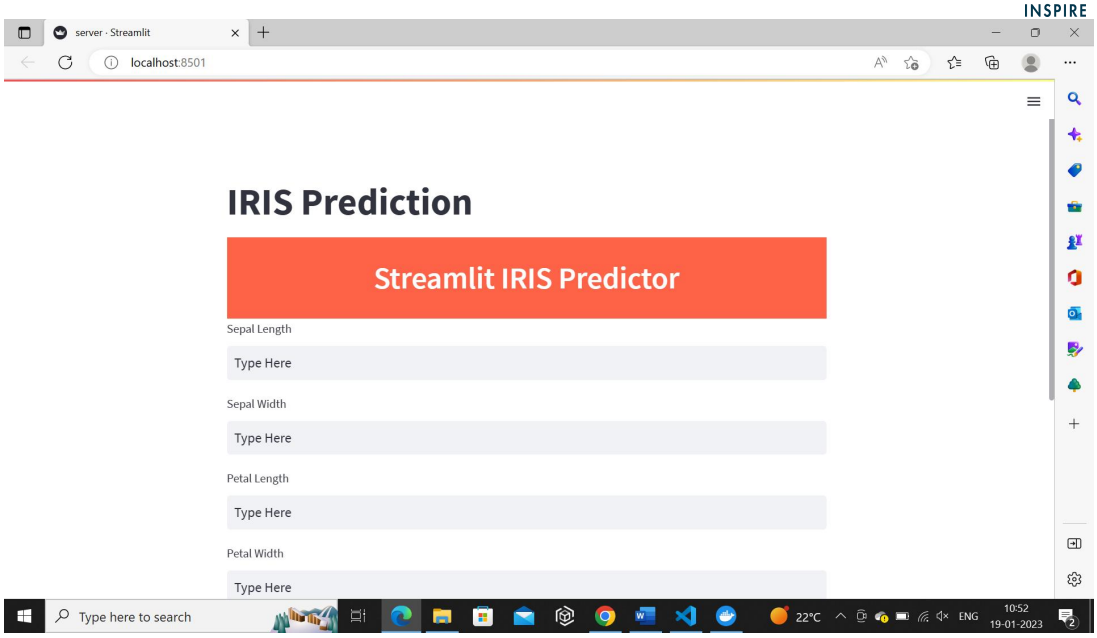
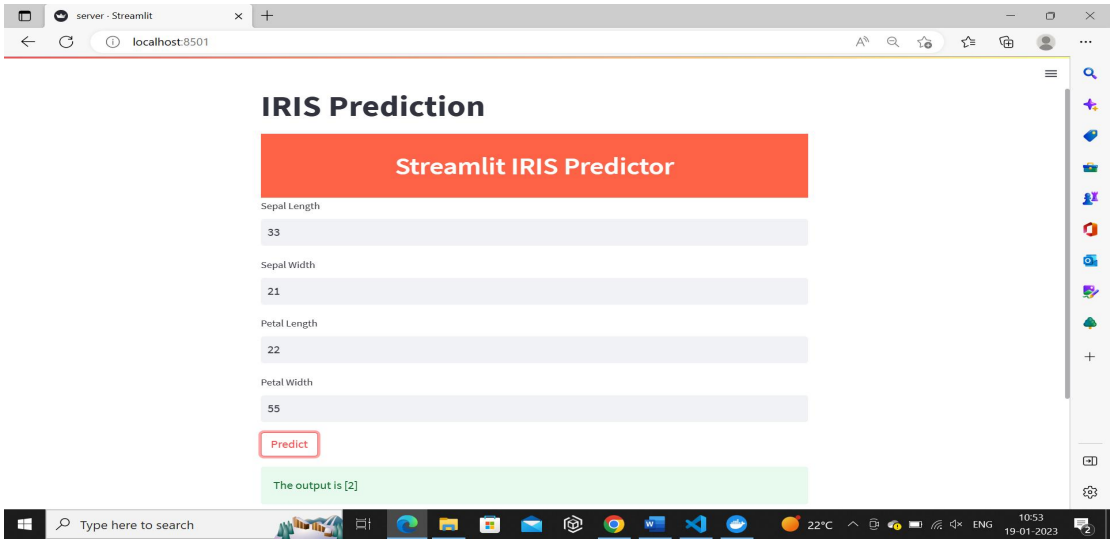
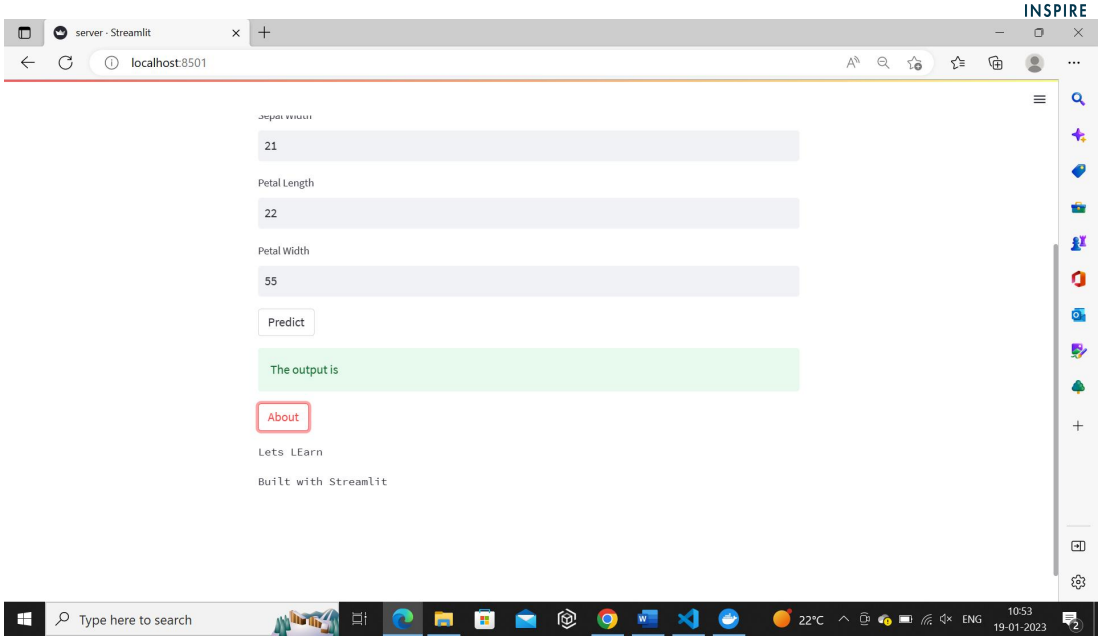

server - Streamlit
localhost:8501
IRIS Prediction
Streamlit IRIS Predictor
Sepal Length
Type Here
Sepal Width
Type Here
Petal Length
Type Here
Petal Width
Type Here
Type here to search
22°C
ENG
10:52
19-01-2023


server - Streamlit
localhost:8501
IRIS Prediction
Streamlit IRIS Predictor
Sepal Length
33
Sepal Width
21
Petal Length
22
Petal Width
55
Predict
The output is [2]
Type here to search
22°C
ENG
10:53
19-01-2023


server - Streamlit
localhost:8501
21
Petal Length
22
Petal Width
55
Predict
The output is
About
Lets LEarn
Built with Streamlit
Type here to search
22°C
ENG
10:53
19-01-2023